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THE PENNSYLVANIA MUSEUM BULLETIN

A DESCRIPTION OF THE TEXTILE DEPARTMENT OF THE SCHOOL

From a Photograph made in 1907

THE SCHOOL, BROAD AND PINE STREETS

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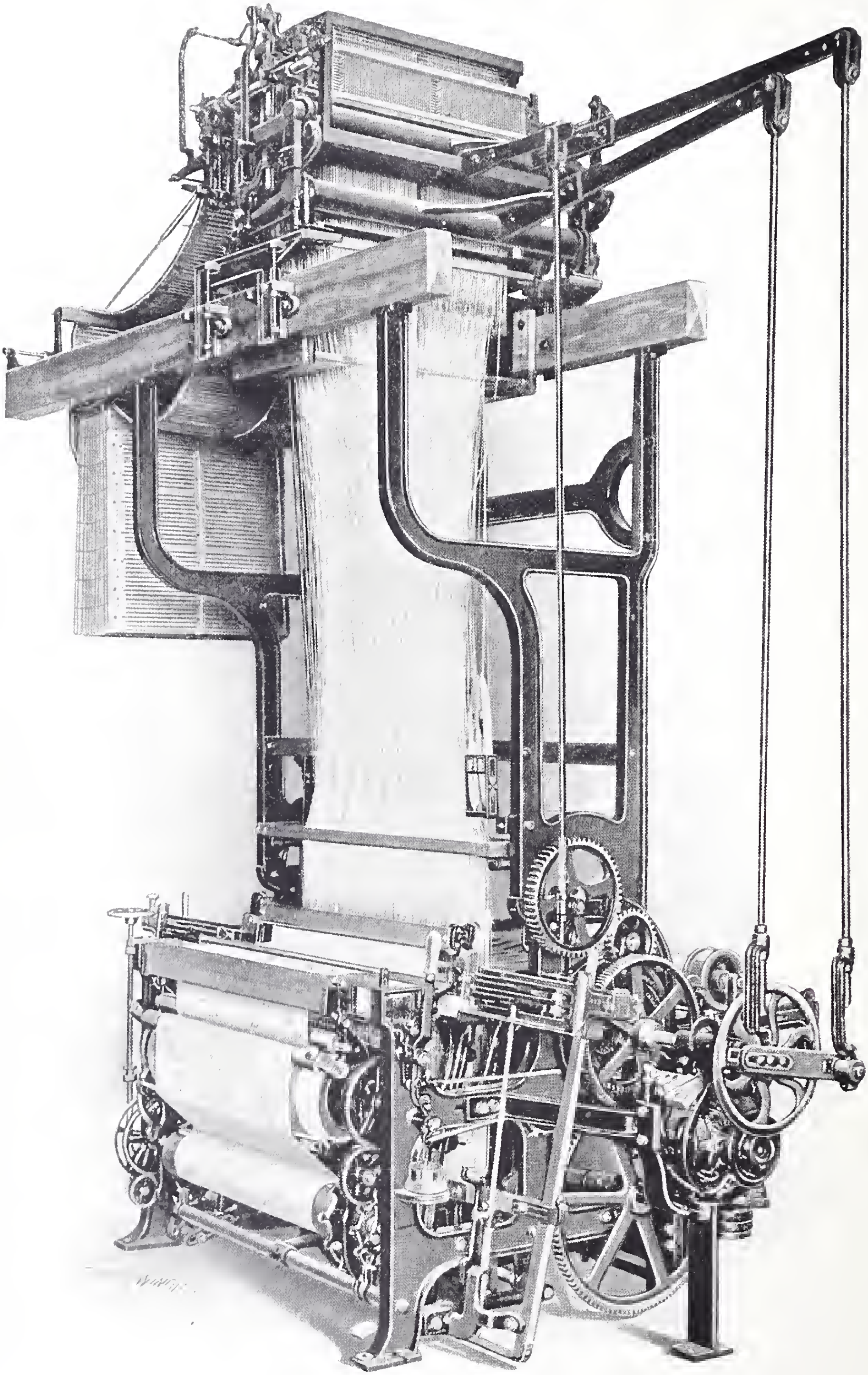

The Jacquard Loom
One of the types used in the School

Technical Education in Textiles

THE Philadelphia Textile School* now in its fortieth year, was the pioneer in this field, having been the sole exponent of technical education in textiles in America for thirteen years. It demonstrated to the world the feasibility of combining in a school, both theoretical and practical instruction in the processes from the raw material to the finished goods; the result has been an important factor in giving the Philadelphia Textile School the leading position in the ranks of similar institutions of learning.

The mechanical equipment of the School includes the latest productions of the machine-builder's skill, and by means of these appliances the student is enabled to bring out in great variety, fabrics of commercial utility and value. From the raw materials onward, the student designs and executes under the guidance of experts. He is not only taught how to calculate a result, but also to perform the actual operations of its production.

His studies include a chemical as well as a physical investigation of the various raw materials, for in these days of close competition, every property of the material in hand must be understood. Waste must be reduced to a minimum, and then utilized; hence the importance attached to a knowledge of the nature of material, a knowledge of which chemistry helps to supply. Without such knowledge no one will be able to obtain the best results.

One does not have to investigate the expensive silks and intricate tapestries to form an idea of the degree of skill required by those who produce these products. The simplest muslin, with the innumerable small fibres of which it is composed, its fineness and beautiful purity, all testify to wonderful achievement of mechanical invention and the manipulation of material.

The courses of study offered by the School equip the graduate to choose either the commercial or the manufacturing branches of the business, each of which is divided into sections as to buying and selling and the various departments of production. They, in turn, again divide with reference to the raw materials, viz.: cotton, silk, wool, worsted, linen, etc.

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*The Philadelphia Textile School was organized in 1884. It represents the most important effort in America to organize the instruction in an Art School, with reference to its application to the needs of the Textile Industry."

"The development of this purpose was accomplished through the generous co-operation and support of the most energetic and influential members of the Philadelphia Textile Association. This Association, formed in 1882, having kept prominent among the objects for which it was created, the fostering of technical education. At that time, no such school existed in this country, and it was necessary to lay the foundation without previous knowledge of the methods to be adopted, or means to be employed to reach the desired end."

"The initiative in this was taken by Mr. Theodore C. Search, then President of the Textile Association, as well as Vice-President and Chairman of the Committee on Instruction of the Pennsylvania Museum and School of Industrial Art.

ORGANIZATION OF THE TEACHING STAFF

The organization of the Teaching Staff is the result of the most careful selection of men of acknowledged ability in their respective lines. They are not only proficient in both the practical and theoretical side of the work, but they are skilled in methods of imparting knowledge in a systematic manner. As recognized experts, their services as such are eagerly sought in the settlement of technical controversies in the commercial world, and this keeps them abreast of the newest processes and productions, and in touch with actual conditions in the industry.

INFLUENCE OF THE SCHOOL

The young man who is considering the choice of a school wherein to fit himself for his life's work should not only take into consideration the practical character of the instruction offered, but he should endeavor to acquaint himself with the importance of the work which the school's graduates are doing in the industry.

The school does not offer inducements in the way of promising to find positions for its graduates, but the fact remains that in recent years the demands the Industry makes upon it for suitable young men are in excess of the supply.

STUDIES INCLUDED IN THE COURSE EMBRACE SILK, COTTON, WOOL AND WORSTED

To speak more directly of the courses of instruction which are subject to such revisions and additions as experience suggests: the diploma of the school is awarded upon the completion of either of two courses, viz.: the Regular Textile Course and the Course in Chemistry, Dyeing and Printing, each requiring three years of study. Certificates are awarded upon the completion of courses of study in Cotton, Wool and Worsted, Silk and Figured Design.

Studies included in the Regular Textile Course are, Weave Formation, Analysis and Structure of Fabrics, Weaving, Yarn Manufacturing, Knitting, Color Harmony, Jacquard Sketching and Design, Chemistry, Dyeing and Finishing.

Studies included in the Chemistry, Dyeing and Printing Course are, Chemistry—Inorganic, Qualitative, Quantitative, Organic and In-

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Indeed, he assumed at first the entire financial responsibility of organizing and equipping the Textile School, and to his devoted and untiring efforts in its behalf, from its inception to its present high state of development, more than to all other agencies, its success is due."

"The Institution possesses an extensive equipment unsurpassed by that of any similar institution in the world. It consists of the latest machinery for the manufacture of yarn, for weaving, finishing and dyeing. All of these machines are of commercial proportions, not mere working models, and they turn out work such as is met with in the best markets of the day. In addition to this practical equipment the different departments are provided with the apparatus necessary for conducting scientific tests and examinations of fibres, yarns, fabrics, dyestuffs, oils, waters, etc., with a view to locating the cause of possible defects."

dustrial, Technical Analysis, Chemistry of Dyestuffs, Dyeing—Elementary, Intermediate and Advanced, Shading Compounding and Matching, Color Mixing and Spectroscopy and Printing.

Instruction is planned so that each forms an important part of the whole, the full value of any one being dependent upon a knowledge of the others. Experience has proved that this grouping of studies affords an unexcelled opportunity for laying a foundation such as will best enable the student to successfuly specialize after graduation, it being generally admitted that specialization attains its greatest ends when supported by a broad knowledge of the industry in general. The following gives a general idea of the scope of these studies:

WEAVE FORMATION

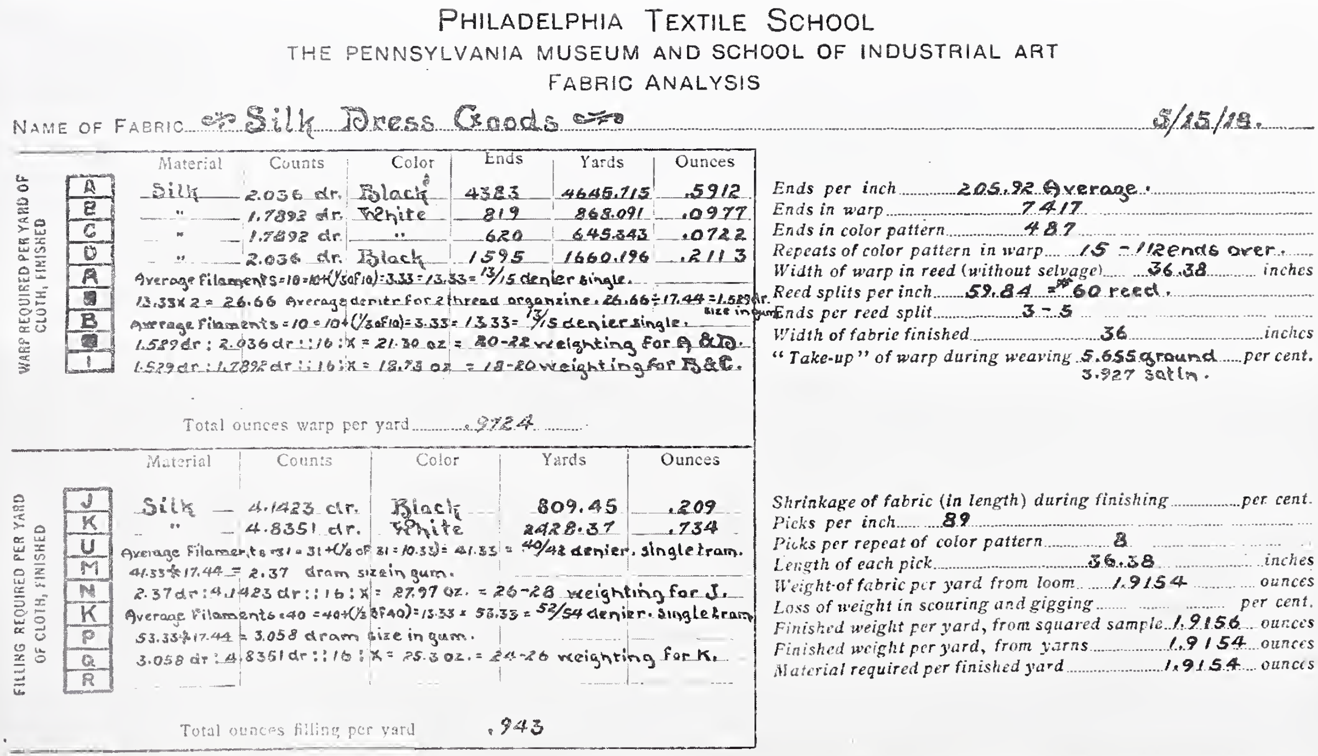
Embodies at the start the study of the different methods of interlacing threads to form weaves, without especial reference to particular fabrics. There are thousands of different weaves, each with its peculiarities; some suited to this fabric, and some to that; some few which might produce a desired effect, and many others which would be far more efficient in other styles. It is indispensable that these many varieties of weaves should be learned in a thorough manner before going into the more difficult work of combining and utilizing them in the fabrics for which they are best adapted.

After carefully considering the various weaves, with their accompanying peculiarities of take-up of the warp in weaving, and their capacity for taking few or many warp threads per given space, the next step is their combination for fancy single-cloth weaves for all classes of fabrics. Following these come weaves with the addition of an extra warp or an extra filling, leading up to double cloths and ultimately to even more intricate forms of interlacings. The principal truth to be realized by every prospective student of design is the prime necessity of becoming thoroughly familiar with the alphabet of the subject before trying to work on any particular class of goods. Obtain a thorough grounding in principles at the start, and the subsequent problems will be solved with a degree of skill and facility impossible otherwise. All lectures are supplemented by illustrations, consisting of specimens of different goods containing the weaves, discussed for the purpose of showing the difference between the design on paper and the woven fabric. This trains the mind to a true conception of the woven product with regard to size of pattern, texture and general appearance.

ANALYSIS AND STRUCTURE OF FABRICS

The first step in this subject is the study of the methods of grading yarns as to size, and the calculating of various lengths and weights. Then follows the analysis of specimens of fabrics touched on in the study of weave formation. Here the student has the opportunity of observing the weaves under various conditions of texture, coloring and finish. Among the different things to be ascertained by the student are the weave, number of warp and filling threads per inch, coloring, take-up in weaving, counts of the different yarns, shrinkages, etc., so that a close estimate can be made of the weight of materials necessary to produce a given piece of goods.

The structure of fabrics is a subdivision of the subject, including the planning of every detail of the specifications necessary in the



PHILADELPHIA TEXTILE SCHOOL

THE PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART

FABRIC ANALYSIS

NAME OF FABRIC Silk Dress Goods 5/15/18.

WARP REQUIRED PER YARD OF CLOTH, FINISHED

	Material	Counts	Color	Ends	Yards	Ounces
A	Silk	2.036 dr.	Black	4323	4645.715	.5912
B	"	1.7892 dr.	White	819	868.091	.0977
C	"	1.7892 dr.	"	620	645.343	.0722
D	"	2.036 dr.	Black	1595	1660.196	.2113
A	Average filaments=10=10+(1/3 of 10)=3.33=13.33=13/15 denier single.					
■	13.33×2 = 26.66 Average denier for 2 thread organzine. 26.66÷17.44=1.529 dr. size in gum					
B	Average filaments=10=10+(1/3 of 10)=3.33=13.33=13/15 denier single.					
■	1.529 dr : 2.036 dr :: 16 : X = 21.30 oz = 20-22 weighting for A & D.					
I	1.529 dr : 1.7892 dr :: 16 : X = 18.73 oz = 18-20 weighting for B & C.					

Total ounces warp per yard .9724

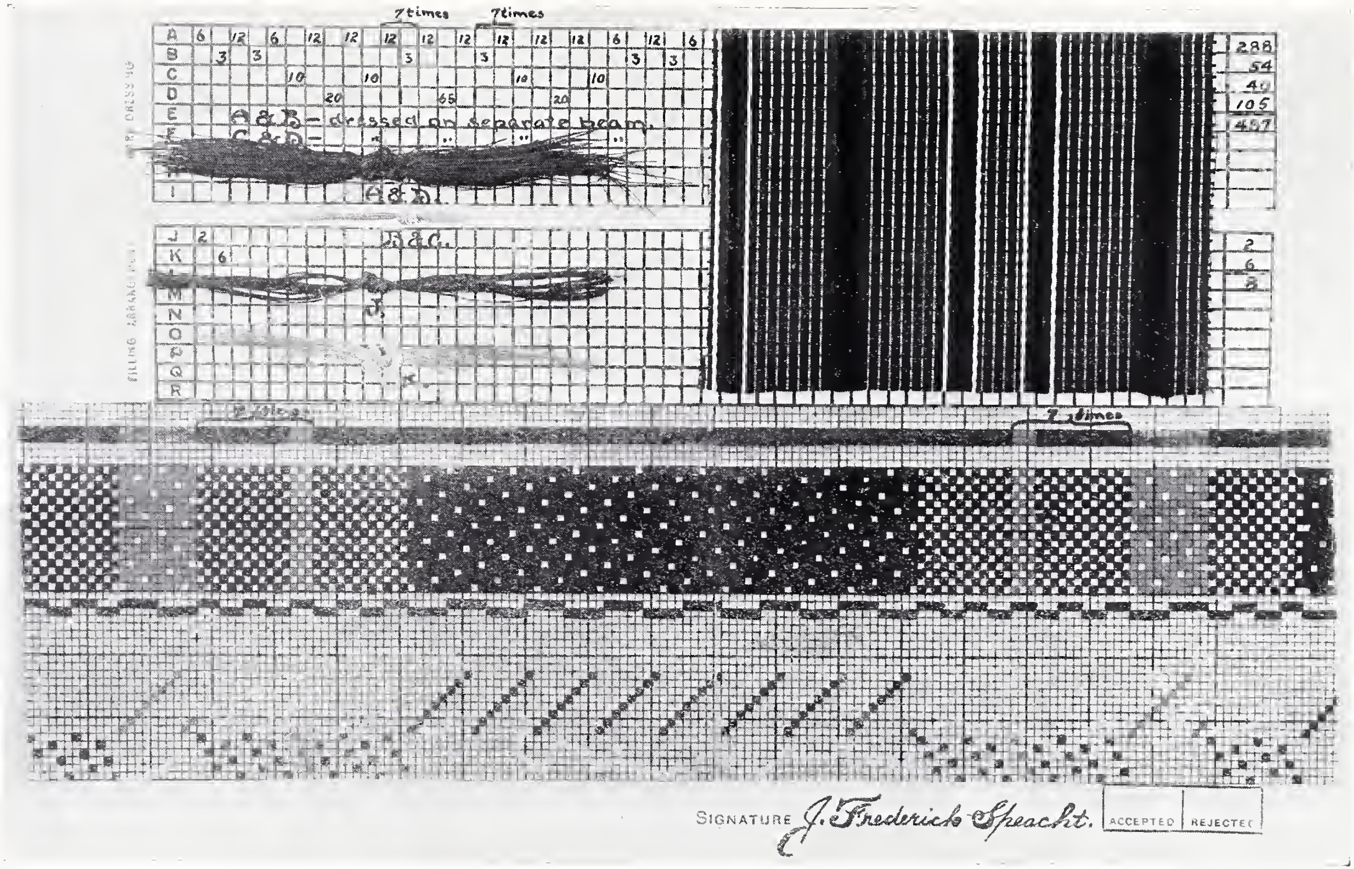
Ends per inch 205.92 Average.
Ends in warp 7417
Ends in color pattern 487
Repeats of color pattern in warp 15 - 112 ends over.
Width of warp in reed (without selvage) 36.38 inches
Reed splits per inch 59.84 = #60 reed.
Ends per reed split 3 - 5
Width of fabric finished 36 inches
"Take-up" of warp during weaving 5.655 ground 3.927 satin. per cent.

FILLING REQUIRED PER YARD OF CLOTH, FINISHED

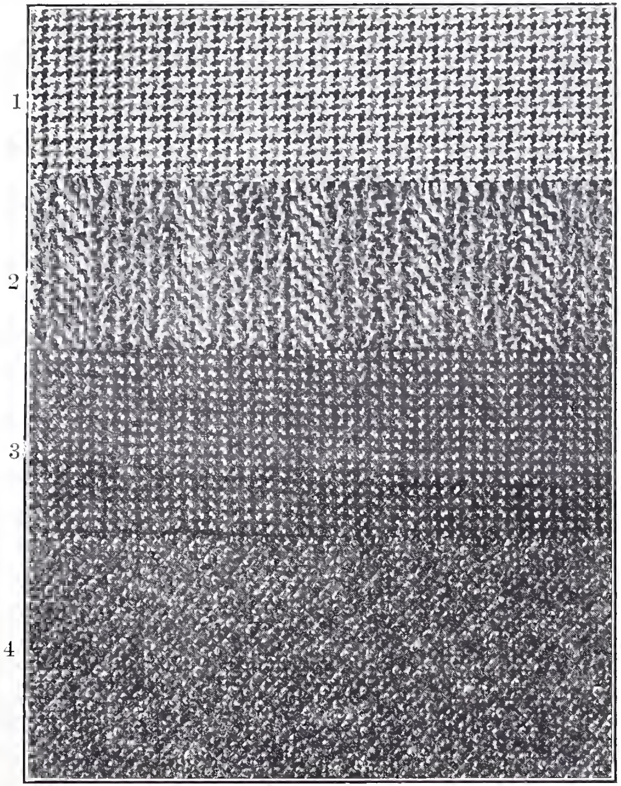
	Material	Counts	Color	Yards	Ounces
J	Silk	4.1423 dr.	Black	809.45	.209
K	"	4.8351 dr.	White	2428.37	.734
U	Average Filaments=31=31+(1/3 of 31=10.33)=41.33=40/42 denier. single tram.				
M	41.33÷17.44 = 2.37 dram size in gum.				
N	2.37 dr : 4.1423 dr :: 16 : X = 27.97 oz. = 26-28 weighting for J.				
K	Average Filaments=40=40+(1/3 of 40)=13.33=53.33=52/54 denier. single tram.				
P	53.33÷17.44 = 3.058 dram size in gum.				
Q	3.058 dr : 4.8351 dr :: 16 : X = 25.3 oz. = 24-26 weighting for K.				
R					

Total ounces filling per yard .943

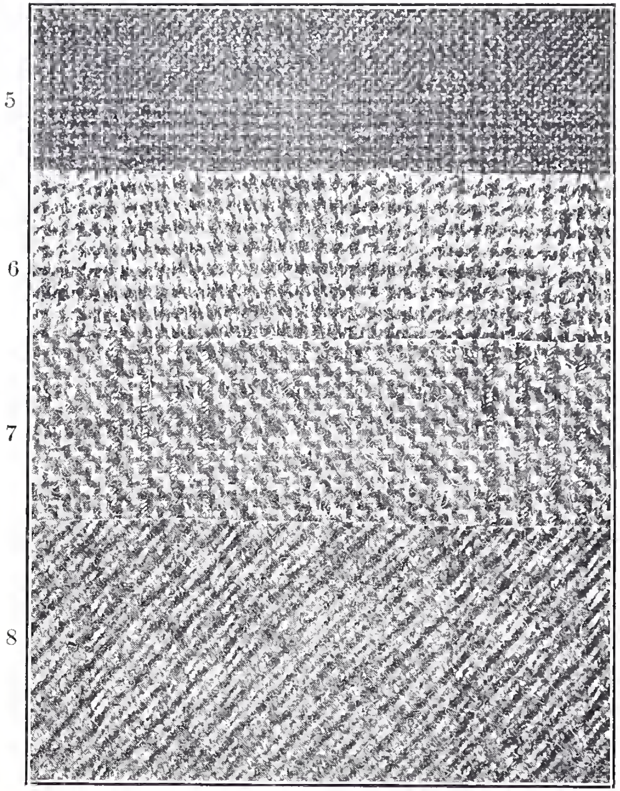
Shrinkage of fabric (in length) during finishing per cent.
Picks per inch 89
Picks per repeat of color pattern 8
Length of each pick 36.38 inches
Weight of fabric per yard from loom 1.9154 ounces
Loss of weight in scouring and gigging per cent.
Finished weight per yard, from squared sample 1.9156 ounces
Finished weight per yard, from yarns 1.9154 ounces
Material required per finished yard 1.9154 ounces



Design, weave, color, material, texture, finish, size and number of threads, are factors that unite in producing effectiveness in the woven fabric. The analysis of typical fabrics affords an opportunity for the student to acquire a knowledge of the details that bring about the results attained by experienced men. The analysis sheet here reproduced is an example of student work in this study.



No. 1. Worsted Suiting
No. 2. Woolen Cassimere Suiting
No. 3. Woolen Cassimere Suiting
No. 4. Woolen Cheviot Suiting



No. 5. Woolen Cassimere Suiting
Nos. 6-7. Fancy Tweed Suiting
No. 8. Woolen Cheviot Suiting

The above are specimen types of woolen and worsted fabrics. Designed and executed throughout by students. All particulars for manufacture must be predetermined, including shrinkage, both in width, length and weight ofttimes as high as 25% and 30%.

production of woven goods, including design, color, material, quality and quantity, directions for placing in the loom and for finishing. These specifications embrace a variety of fabrics, and, as the student actually produces goods from many of them, he is enabled to see the effect of his plans in the various details of manufacture and to note defects he could not have appreciated otherwise.

WEAVING

Under this heading are included such subjects as dressing, warping, beaming, drawing-in, reeding and chain building, as well as the actual operation of the loom. All of the preceding operations are carried on by the student after he has prepared full specifications of the fabric to be produced. The aim is to confine the goods to be woven to such principles as have been acquired in the studies of design and analysis. Thus each of these three branches regulates the progress in the others, and serves to impress and strengthen them by united systematic work. Much stress is laid on the necessity of care in every detail of the preparation of the warp for the loom, not only in the arrangement of the threads on the beam, but in the condition of the heddles and harness frames. The timing and setting of the looms so as to produce the best results in the fabric is considered in each case. The students are required to do all of the necessary work, seemingly irksome and laborious at times, not with the idea of making weavers, but to thoroughly acquaint them with the full details, so that they may become intelligent producers of woven fabrics.

YARN MANUFACTURE

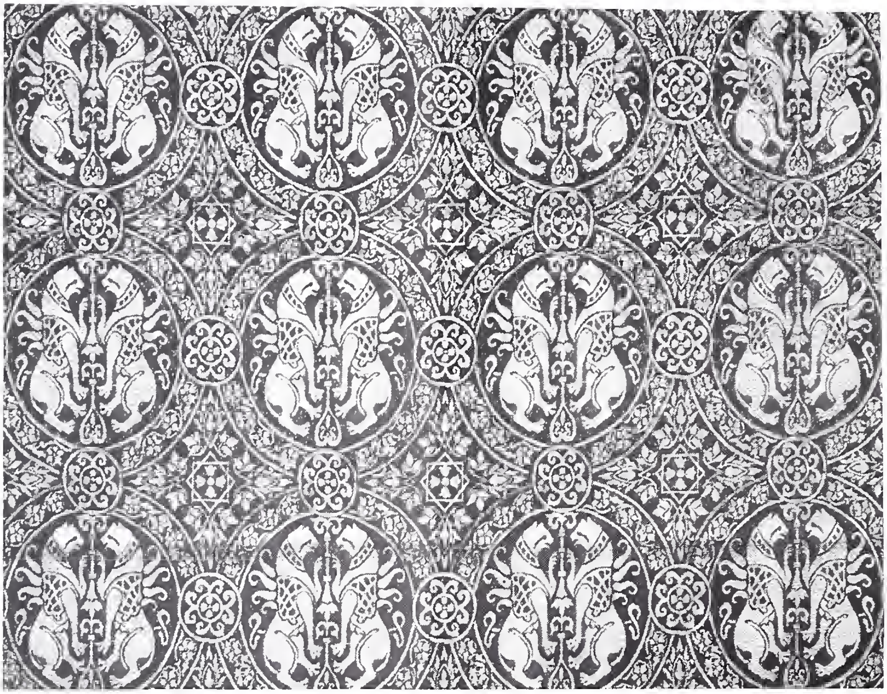
The production of wool, cotton and worsted yarns is thoroughly studied, both in theory and in practice. In this, as in weaving, the machines used for demonstration are the best to be obtained, regardless of the name of the maker.

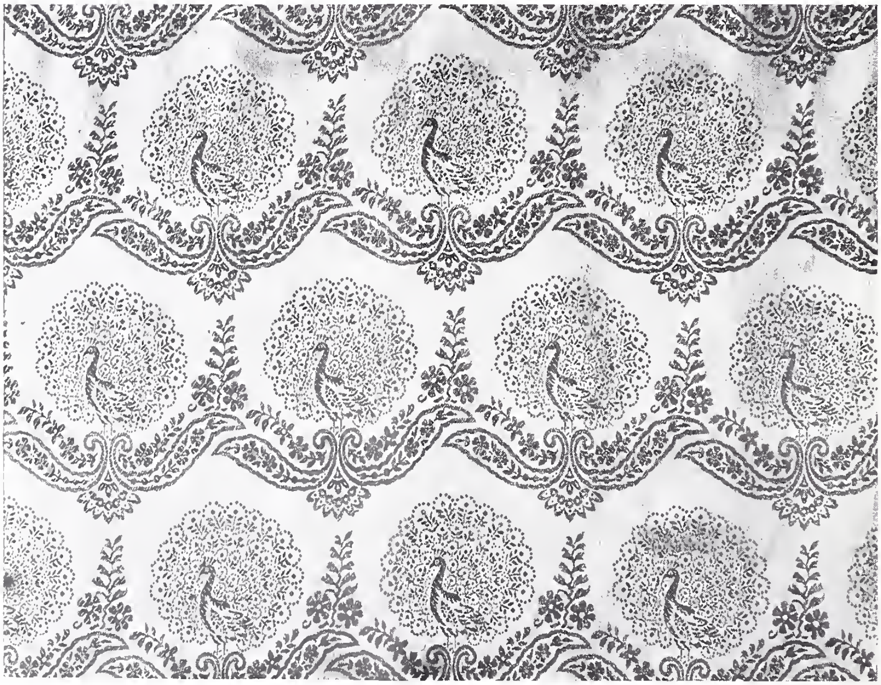
The chief advantage of school training in this subject does not lie in the actual operation of machines, but rather in the knowledge of how to adjust the parts of the machines to suit varying conditions necessitated by different lengths of fibre and counts of yarn, in order that the machines may be run to the best advantage. The use and structure of each portion of the machines is studied in its relation to the other parts with reference to its effect on the product. Starting with the desire to produce a certain yarn, all the necessary calculations of speed and delivery are made, so that the proper amount of work may be done at each operation and the fibre handled with the least amount of injury and waste. The knowledge of how to blend fibres and produce yarns makes the person who is also familiar with designing and weaving exceptionally valuable, either as designer, as overseer of weaving or of carding and spinning, or in those positions in which men are expected to superintend all three of these operations.

Knitting is studied in connection with this subject, with the aim of giving the student a knowledge of the general principles of knitting and a familiarity with the practical working of knitting machines, ribbers and loopers.

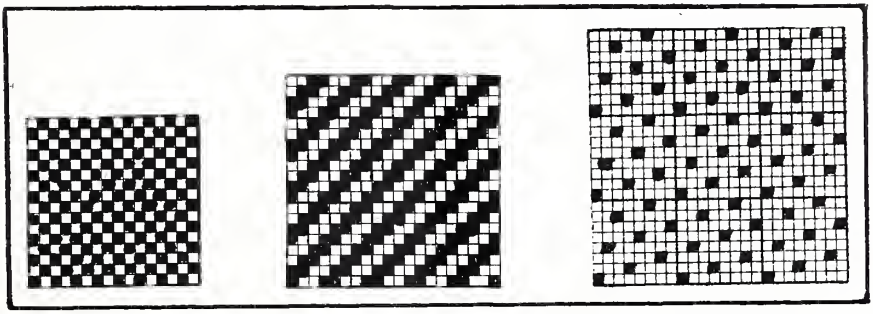
COLOR HARMONY

While the principles of color are the same, whatever their application, the course of study is so arranged as to bear entirely on yarns and fabrics. Beginning with the raw pigments, and work-





Fabrics from designs made by students in the Textile School ing on paper and in the actual goods, the eye of the student undergoes a gradual and almost unconscious training in the application of what is good and what is bad in color combination. He becomes able to decide not only on what colors or shades may be tastefully combined, but also on the relative depths of shade which will be allowable under given conditions and in given combinations. His knowledge of the structure of fabrics and of design enables him to estimate correctly the quantity and quality of the color which will be visible on the face of the goods, and to make correct allowances in his original color scheme for the modifications of effect which these conditions imply.



The weave—the term used to designate the manner of interlacing warp and filling, must be thoroughly understood, for its influence on the fabric is a determining factor in both ornamental effect and wearing qualities. The three fundamental types of weaves illustrated, are those from which may be derived the thousands of forms of interlacings to be considered in the study of Weave Formation.

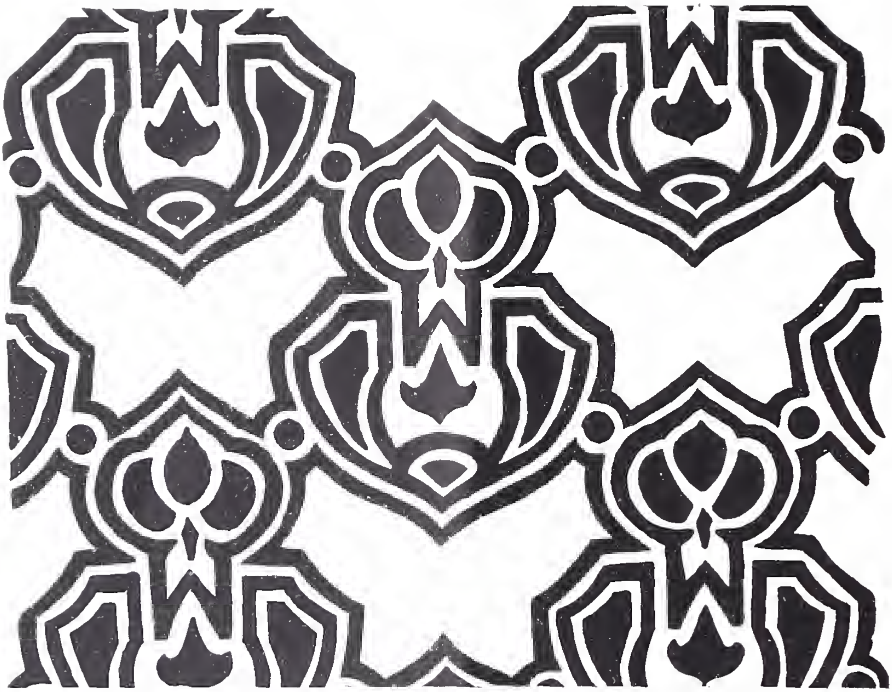
If one compares American fabrics of fifteen or twenty years ago, with those of today, one cannot but be impressed with the tremendous development that has taken place in the color and design of present-day fabrics.

Prior to and immediately following the founding of the School, it was conceded that anything superior in color must have originated in France, therefore, it was the custom to seek imported textiles.

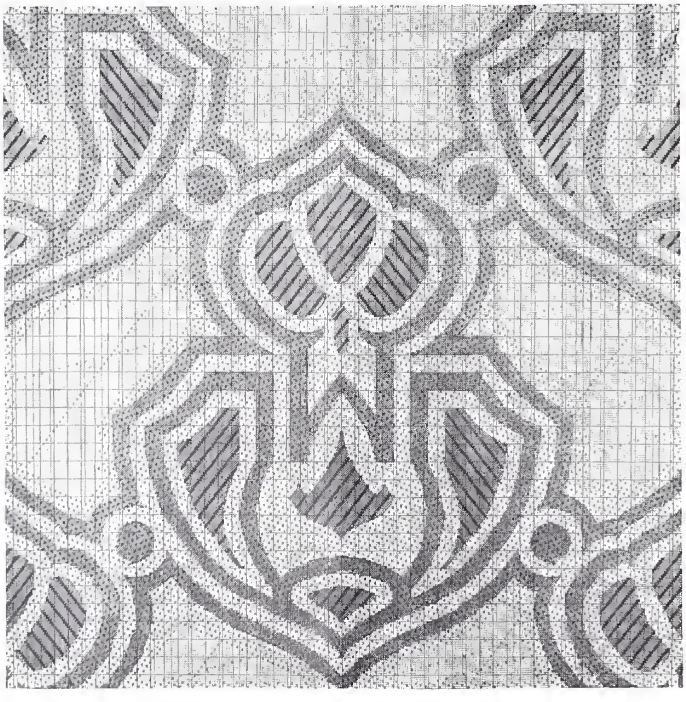
The absence of an American School to develop talent to solve this problem necessitated the founding of the School of Industrial Art and later the addition of the Philadelphia Textile School. That the School has succeeded in cultivating a taste and appreciation, for good color and design, is reflected in the products of today made under the direction of those who have profited by the instruction received there.

Present-day living conditions require attention to the "nice" things in fabrics. The better decorative scheme of the home is the background for the wearing apparel of the man and woman of today. Consequently the demand for better colored materials is felt in all lines of textiles, from the simplest of cotton fabrics to the most elaborate silks.

It is gratifying to be constantly told, but for the work done by the School we would not be making in the mills of the country,

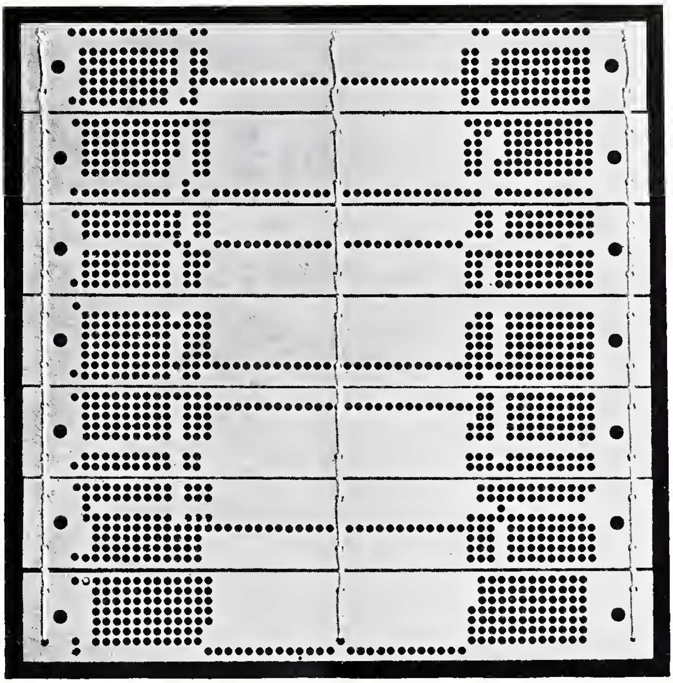


(A) Original sketch of intended design for Damask.

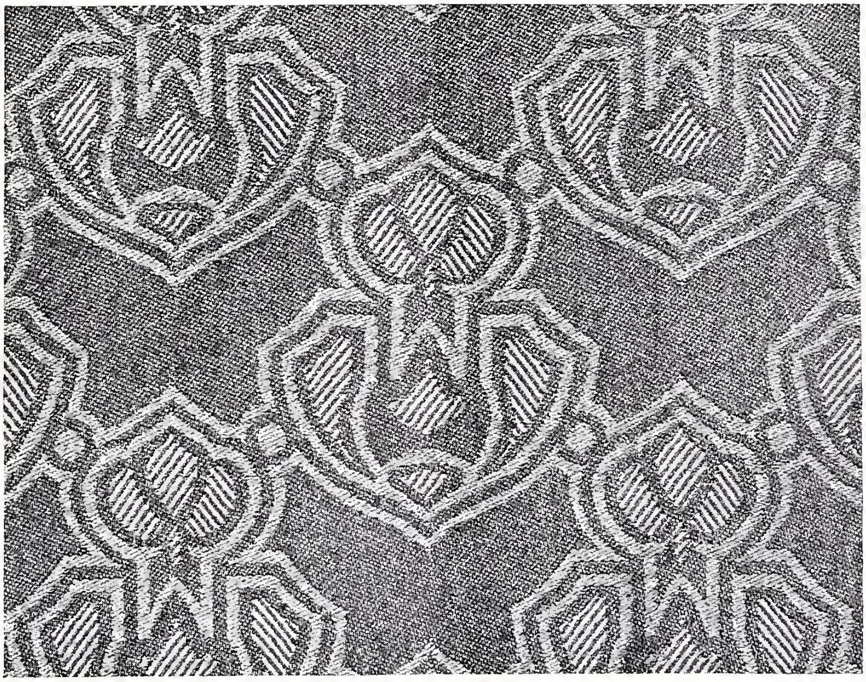


(B) Enlarged design made from sketch on squared paper showing the position of every thread in the pattern.

Few people have any conception of the details involved in the manipulation of the threads to produce a figure pattern. The following figures illustrate in a small degree the steps in the making of a Damask, which is the simplest



(C) A few cards from the set that was cut from the large design, every hole in the card being cut from a dot on the design, there being several hundred of these cards for this pattern.



(D) The fabric produced from the cards operating on a Jacquard Loom and producing the cloth resembling the original conceived design.

kind of a problem of the figured fabric class; the more elaborate and complicated fabrics require far greater knowledge of fabric construction and great care and attention to details to obtain satisfactory results.

fabrics more appealing to our methods of living and taste, that in color far surpass anything ever imported. Attractiveness in color, after all, is the best selling factor of a fabric, and to be a good selling fabric it must have that which color alone can impart.

JACQUARD SKETCHING AND DESIGN

Is an outcome of, and is dependent on, the instruction in fabric structure and design. Its object is not to teach the make-up of the fabrics, but to adapt certain principles already learned to the capabilities of the Jacquard machine. The working up of sketches for the loom, together with the painting of various schemes of suitable coloring, is the principal aim. The methods of selecting the proper squared paper are considered, and the sketch is transferred to the squared paper and worked up according to certain preconceived ideas. Instruction is given in the principles of the different kinds of Jacquard machines, the methods of tying them up and of cutting the cards to suit the different tie-ups. The prevailing tendency toward fancy fabrics, with larger and more varied effects, serves to emphasize the necessity of an acquaintance with this continuation or outgrowth of the harness loom. In fact, a man cannot be considered well posted in weaving unless this knowledge of weaving mechanisms embraces the Jacquard machine as well as the head motion, the dobby, the witch and the cam motion.

CHEMISTRY

A thorough course of instruction in this subject is given, including a chemical and microscopical study of the characteristic features and properties of the important fibres. In addition to this, the various chemicals employed in scouring, dyeing and finishing are studied with reference to their action on the fibres, and also with a view of determining their purity and commercial value. The chemical principles involved in textile processes are scientifically studied. Of course, the main object in scouring, dyeing, bleaching, etc., is to attain quality and quantity in results; but how can we better regulate, adjust and improve these results than by a study of the basic principles? The chemistry taught begins with the elementary forms, and is pursued through the higher forms of qualitative, quantitative and technical analysis and organic chemistry.

DYEING

The course of study is carried on with the idea of inculcating into the mind of the student a scientific conception of what he is doing, and at the same time the practical side of the question is given due consideration. The experiments are not limited to the laboratory pot and kettle, where the results are too often deluding, but the student carries on his dyeing on a scale and in a manner that enables him to encounter and overcome the petty difficulties and changing conditions of the mill and dye house.

The technical examination and valuation of commercial products is given especial attention. The course of study also involves a consideration of the different methods of dyeing the various fibres, both animal and vegetable. The most important of the modern dyestuffs are applied to various forms of textiles such as loose stock, yarn and cloth. A study is also made of the new processes of dyeing which are being constantly introduced, as well as of the mechanical appliances which many of them necessitate.

FINISHING

Is treated throughout the larger part of the term in lectures, and at the latter part the many fabrics produced in the school are put through the processes of finishing necessary to bring them out as articles of commerce. It is well known that, no matter how carefully and perfectly a piece of goods may be produced, if it is not handled intelligently in the finishing process, all previous care will be for naught. In fact, in the case of many classes of fabrics, the goods as they come from the loom are rough and uncouth, depending entirely on the finisher, with his possession or lack of skill to bring out a salable article.

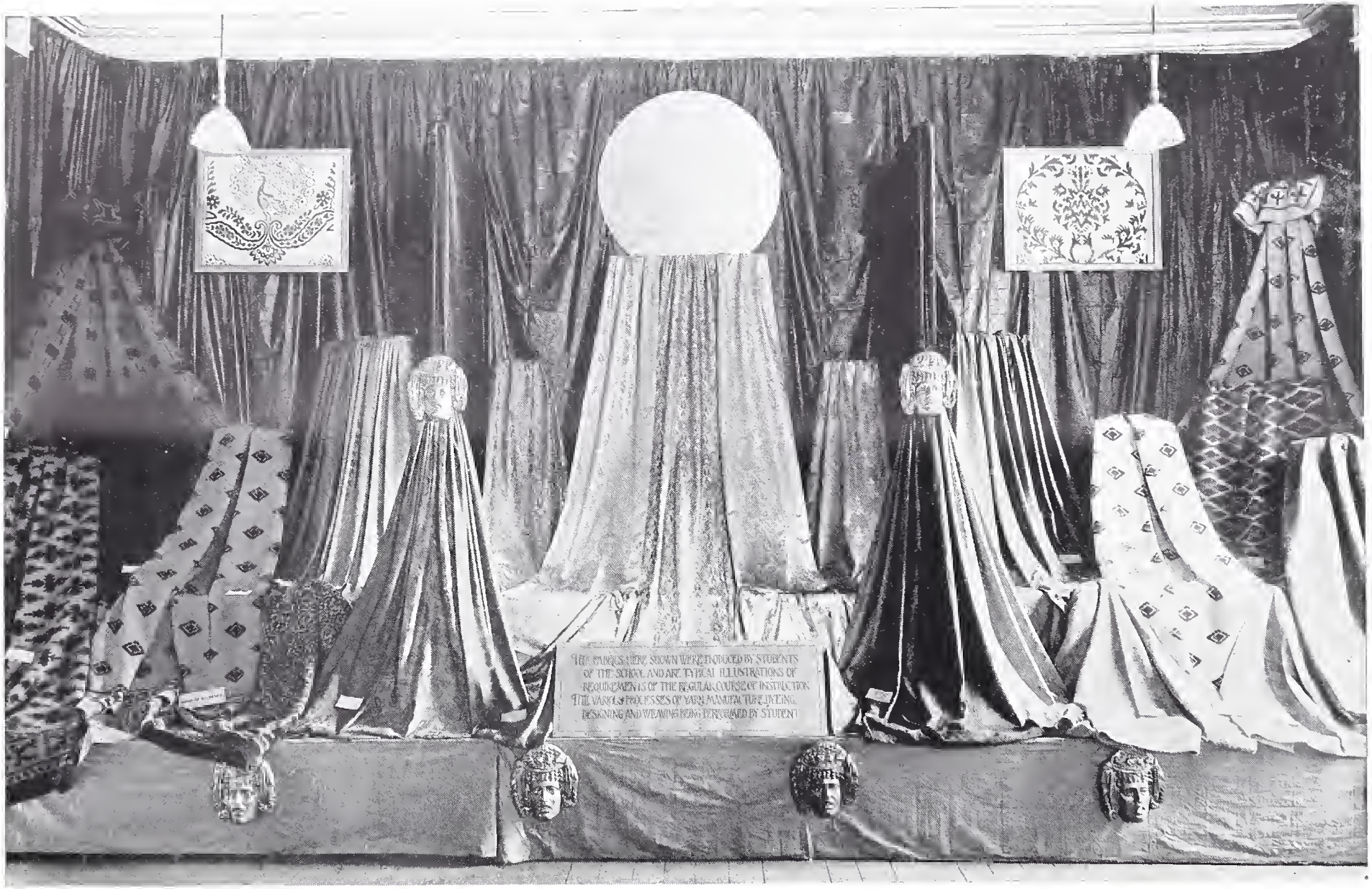
The Importance of Chemistry to the Modern Dyer and Finisher

CHEMISTRY is the foundation of every industry. Whether we consider the manufacturing of dyes or the understanding and control of the various processes dependent on the use of chemicals in the dyeing and finishing processes of the textile industry, it plays its part. Chemistry is rapidly advancing in importance and the dyehouse and related activities of the textile industry must receive their quota of trained men, if it is to keep pace with the advance made in other industries. Our larger dyeing and finishing plants have long since appreciated chemical control of their plant, and the smaller plants are profiting by their examples.

The manufacture of dyes and chemicals, produced by intensive chemical research, which are finding their way into the dyehouse and other departments are of comparatively recent origin. The first important dye from coal tar products was discovered about fifty years ago and each decade has added its improvements.

It can easily be seen that the dyer of the past did not require the all-round knowledge that is necessary to a well-informed dyer of today. When dyes were limited to a few natural dyewoods the dyer's possibilities were likewise limited. The methods of application were stabilized and products remained without development, a dyer was enabled through his practical experience to know all that was necessary about his position. Now all this is changed and will continue to change.

In no other industry are there so many products of widely different properties and characteristics, and of so various and numerous applications. From the bale of cotton, the wool on the sheep's back or the silk cocoon to the finished product, many of the steps are chemical in nature, under control of chemical processes. Today thousands of different dyes, each with its peculiar properties, suitable for certain uses and unsuitable for others, of widely differing degrees of fastness and methods of application to the material, are available. It is to be remembered that the dyer of today must have a broad general and chemical education if he is to cope with the problems


THE FABRICS HERE SHOWN WERE PRODUCED BY STUDENTS
OF THE SCHOOL AND ARE TYPICAL ILLUSTRATIONS OF
REQUIREMENTS OF THE REGULAR COURSE OF INSTRUCTION
THE VARIOUS PROCESSES OF YARN MANUFACTURE, DYEING,
DESIGNING AND WEAVING BEING PERFORMED BY STUDENT

Corner in Recent Exhibition of Students' Work Showing Silk Brocades, Upholstery, Figured Robes and Blankets presented in the textile field. Slipshod hit-or-miss methods must be replaced by underlying knowledge of scientific facts.

It is thus the object of the chemist to conserve materials, by cutting waste in processes, recovering by-products, finding better ways of carrying out an operation, protecting the plant in purchasing and standardizing material, helping it in competition with other plants by keeping it abreast of the latest advances in chemistry and in many other ways giving the benefit of a scientifically trained mind. In other words, to produce identical results, textile processes must be carried out under standard conditions, which necessarily means that the raw materials entering the process must be of satisfactory purity and this purity definitely known. Processes stand or fall on this chemical oversight. Among some of the many textile processes that require this supervision might be mentioned the weighting of silk with tin, the bleaching of cotton and wool, the scouring and carbonizing of wool and the mercerizing of cotton, all of which are fundamental to the industry.

Finishing is an essential process in the production of all textiles. The importance of these steps in producing the finished goods cannot be overestimated, since it is due to these treatments that they are made merchantable. Most materials are far from the finished article when they leave the loom. This is particularly true of woolens and other fabrics made from related fibres. The bolivia cloths now so popular are good examples of this, each piece requiring about five hours dry finishing besides the scouring, fulling and dyeing processes. Sateens, lawns or poplins as they come from the loom are quite unlike the attractive fabric in the finished state. These in turn differ greatly in character from hollands for window shades, book cloth or sign cloth. For example, take the ordinary book cloth and it will be found on analysis that the basis is a very common sheeting which after being impregnated with about its own weight of finishing materials and a calendering operation, a fabric is obtained with entirely different properties and utilities than the original. It is the bleaching, dyeing and finishing operations that give the commercial values to these fabrics. Yet we must remember that the product of the loom must be correct if the finisher is to obtain the proper results.

This emphasizes the need of co-operation throughout the entire plant in the course of manufacture. While separated, the processes of dyeing and finishing depend upon other branches of manufacture, because perfect results in one cannot be obtained without perfection in the others. Goods designed improperly will not yield the proper finish, and the reverse is also true. It is quite necessary, therefore, that the designer know what the finishing processes will accomplish in the fabric which he develops, and the dyer should have at least sufficient knowledge to point to improper designing if this has been the cause of his failure in any specific case.

The textile industry uses but comparatively few fibres. How-ever, the complexity of the problem is easily understood when it is realized that wool, cotton or silk from any source, differs widely in characteristics, acts differently toward chemicals, dyes and finishing processes, and in uses to which it can be put. Each fibre is thus individual in character and this individuality must be reckoned with when it is used for any specific fabric, thus bringing to mind the old adage "you can't make a silk purse from a sow's ear." If the selection of the stock is "not right" the proper character of the finished material is unattainable.

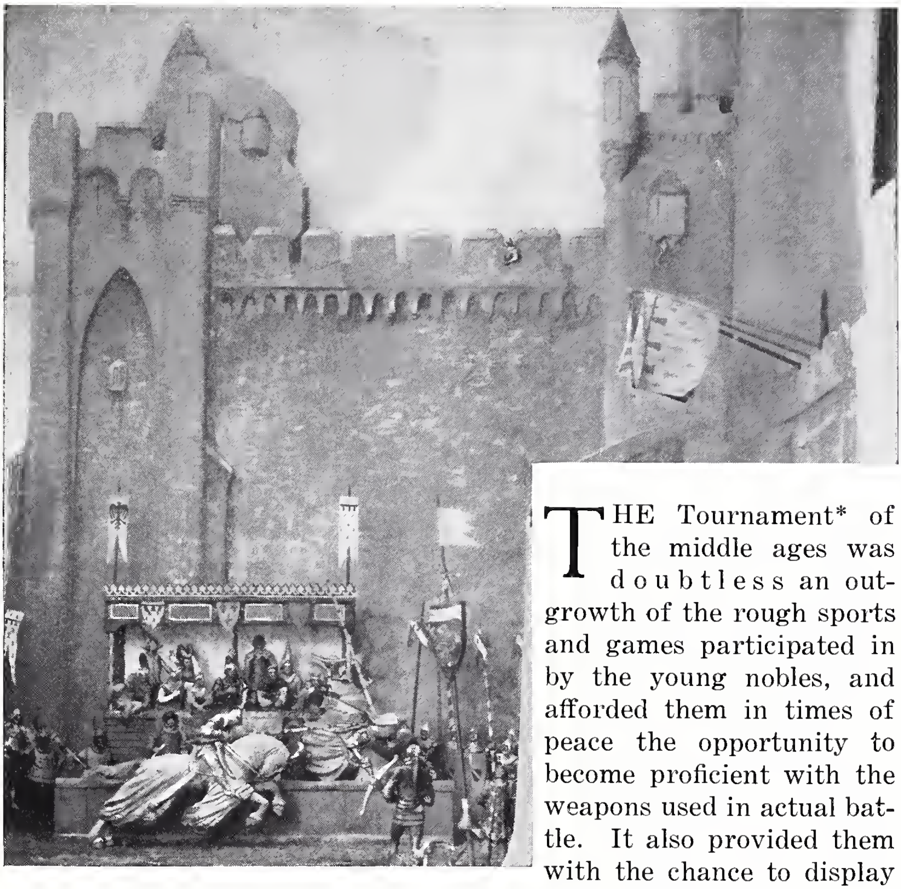
The silk expositions held in New York in February, 1921 and 1923, were a compliment to the dyeing and finishing processes and afforded the very best examples of the importance of these processes in the production of salable material. Most of the fabrics shown were of the most simple structure and while they would not make much of an appeal because of this fact, the wonderful colorings possible in silk fabrics attracted the general public in such numbers as to stampede the show.

For many years the Philadelphia Textile School, with a vision beyond the times, has been supplying scientifically and technically trained men to solve these all important problems. It is significant that the first class in chemistry organized in the School was held in the evening, and its students were the foremost practical dyers of their day, desirous of studying the chemical principles underlying their "every day problems." If their names were disclosed it would be found that these men were the real backbone of the Philadelphia Dyeing Industry, and the plants they have since established are the largest of their kind in the city. The School has not only benefited the practical worker as such, but has placed the industry on a very much higher plane.

Note

Since all that should be written about the two departments of the School would more than fill a single issue of the BULLETIN, it has been thought advisable to tell the story in two installments. A description of the work done in the Department of Industrial Art will therefore be reserved for the next issue of the BULLETIN. Then the reader will find a brief statement of the various courses given. These are: the courses in Design, Advertising and Poster Work, Costume, Illustration, Modeling, Interior Decoration, Metal Work and Jewelry, Pottery and the Teacher's Training Course.

A Model of a Mediaeval Tournament



THE Tournament* of the middle ages was doubtless an outgrowth of the rough sports and games participated in by the young nobles, and afforded them in times of peace the opportunity to become proficient with the weapons used in actual battle. It also provided them with the chance to display their prowess of arms and deeds of chivalry, under the adoring eyes of the ladies; when, with their favors in the form of a veil or sleeve tied to their arms or encircling their helmets they battled their way to glory and renown.

One often wonders in reading descriptions of the tournament and jousts of the *Moyen Age*, how it was possible for men to withstand the frightful shock of the lance at the meeting, as Knight came against Knight, clad in suits of heavy mail, astride their ponderous steeds.

Naturally in a sport of such a rough nature there were many

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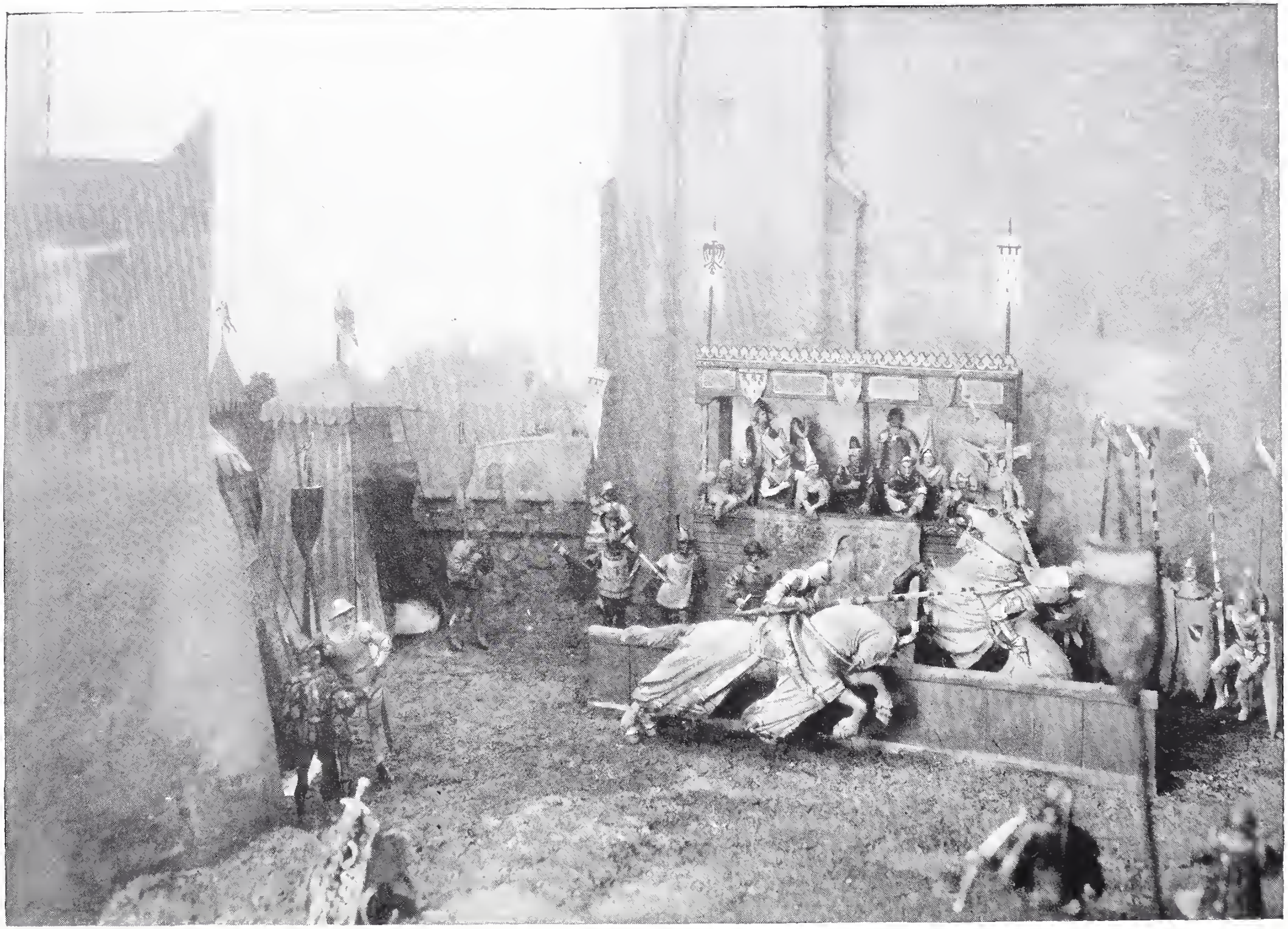
*The model was designed to illustrate a joust typical of those which took place in the Fifteenth Century.

A Lord of Brittany holds the tourney in honor of a band of visiting knights and ladies whom he is entertaining by these friendly contests in feats of arms as was customary in that time.

In the balcony built against the castle wall in the center of the scene sits the lord with the noble ladies of the castle and those who have accompanied their knights on the journey. Their dress is sumptuous in line and rich in color without that grotesque distortion of the figure which became the vogue a few years later in the Renaissance. The women wear the picturesque hennins, cote-hardies trimmed with fur and gowns of brocade, with large patterns, motives



Model of Joust Placed in Children's Section of Pennsylvania Museum

A model showing a mediaeval tournament which has just been placed in the children's section of the Pennsylvania Museum in Memorial Hall in Fairmount Park. This model was made by Edward Warwick and John Ray Sinnock, instructors in the Pennsylvania Museum and School of Industrial Art.

accidents, some resulting fatally. But that they survived the shock at all and that there were not more fatalities was undoubtedly due to the vigorous training they passed through as boys; most of their training was directed towards making them strong and full of endurance for the strenuous life of a Knight in after years.

A candidate for Knight-hood began his long years of training when but a boy, usually receiving this training in the castle of some knight of great reputation. His first duties were those of a page, where under the tutelage of the ladies of the castle he learned to sing, play the harp and viol, backgammon and chess, to be serviceable and chivalrous; at the same time under the direction of some old man-at-arms, he was taught to ride until he was as thoroughly at home upon his horse as upon his own feet. Long hours were spent in the practice of arms and tilting at the quintain until the novice could wield the sword and battle axe and carry the lance. Hunting and falconry also came in as part of his education.

As he grew in bodily strength and expertness in the use of arms he was advanced to the station of esquire, where more service was required of him and his training became likewise more severe.

This change from page to esquire never took place before his fourteenth year and was celebrated by the church with a special religious ceremony "consecrating their Knightly vocation, and hallowing the use of arms they were henceforward destined to carry."

Paul Lacroix in his book "Military and Religious Life in the Middle Ages" quotes a passage from the history of Boucicaut, a marshal of France in the reign of Charles VI, which gives a splendid idea of the "laborious and arduous existence of the young esquire who aspired to become a worthy knight." "Now cased in armour, he would practice leaping onto the back of a horse; anon, to accustom himself to become long-winded and enduring, he would walk and run long distances on foot, or he would practice striking numberous and forcible blows with a battle axe or mallet. In order to accustom himself to the weight of his armour, he would turn somersaults whilst clad in a complete suit of mail, with the exception of his helmet, or he would dance vigorously in a shirt of steel; he would place one hand on the saddle-bow of a tall charger and the other on his neck and vault over him. He would climb up between the perpendicular walls that stood four or five feet asunder by the mere pressure of his arms and legs, and would thus reach the top, even if it were as high as a

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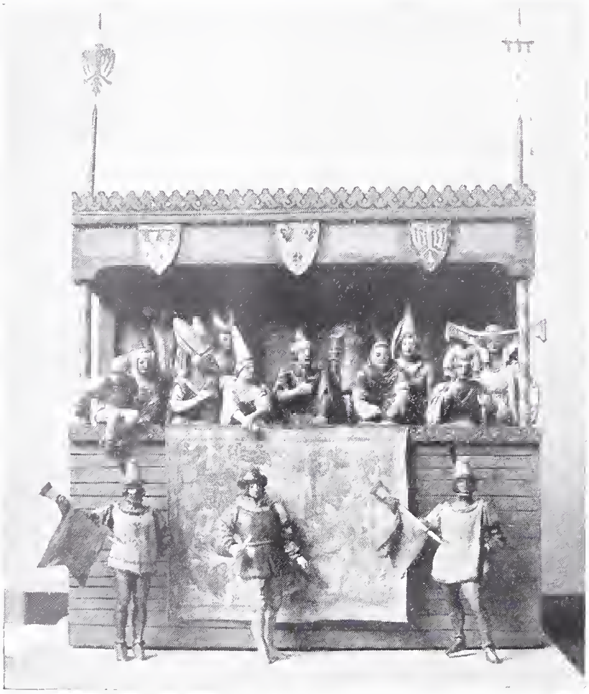
brought from far eastern lands. The wimple and gorget, although passing rapidly out of fashion, is worn by an elderly lady in the group. A monk in the habit of the Dominicans forms one of the interested spectators.

Across the top of the balcony are three shields: the first displays the arms of the Duke of Brittany to whom the host owes his allegiance, the second bears the arms of the King of France and on the right this lord's own device, a golden eagle on a blue field.

The marshal of the day, in half armor, who is the master of ceremonies and two heralds stand on the ground in front. The two contesting knights in the center are represented in the moment of striking. The one on the near side of the barrier has aimed his lance with better success than the other and is tower, without resting in either the ascend or descend. When he was at home he would practice with the other esquires at lance throwing and other warlike exercises and this continually."

In the early period of the middle ages the tournament was "merely a violent athletic pastime, in which the iron men of that period measured their strength one against the other with sword strokes, with lance thrusts and with mace blows." At this time they were not the highly colorful encounters we find later. There were no balconies erected for the occasion, adorned with tapestries, hangings, banners and coats of arms, crowded with princesses and noble ladies in all the beauty of color and material of the dress of the *Moyen Age.*



The Gallery

Before this could come about the Courts of Chivalry had to come into existence and gradually the manners and customs of the people underwent a change and much of the coarseness and roughness of the former type of tournament was done away with and rules and

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about to unhorse his opponent unless his lance should break. The shock of the encounter has thrown the horse of the knight in green upon its haunches. His squire is seen running forward to his assistance either to help him maintain himself in the saddle or aid him if he is thrown to the ground.

Beside the huge doors of the castle another knight in black and gold trappings fully armed, except for his heaume, sits upon his charger ready to enter the lists against whoever is the victor.

All possible means were employed by the designers to verify each detail in order to have the model historically correct and also to endow the scene with a vital human interest, giving the children who visit the museum a striking picture of one phase of the life in that romantic age.

regulations came in which governed them. Tournaments then became gay festivals, balconies were built for the judges and the ladies. These were hung with tapestries and heraldic devices and adorned with banners. Rich fabrics brought from the East by the Crusaders were hung from the balconies and windows of the castle. The tents of the contending Knights, rich in color and design, were pitched at either end of the lists, and all this combined with people in gala attire made the scene rich and colorful to the extreme.

It is credited to the French Seigneur Geoffroi de Preuilli of Anjou that he gave the first tournament that can properly be so called in the year 1066, and that he formulated rules that governed these martial games.

Mr. R. C. Clephan in his intensely interesting and exhaustive study of the tournament says: "The Fifteenth Century marks a distinct epoch in the history of the tourney which became milder and less dangerous to life and limb, a stricter observance to rules and regulations. An oath to observe the rules of chivalry was administered to all cavaliers taking part in the tournament. Many injuries had befallen to the riders in the tourney by the collision of their horses, sometimes by accident, sometimes by design."

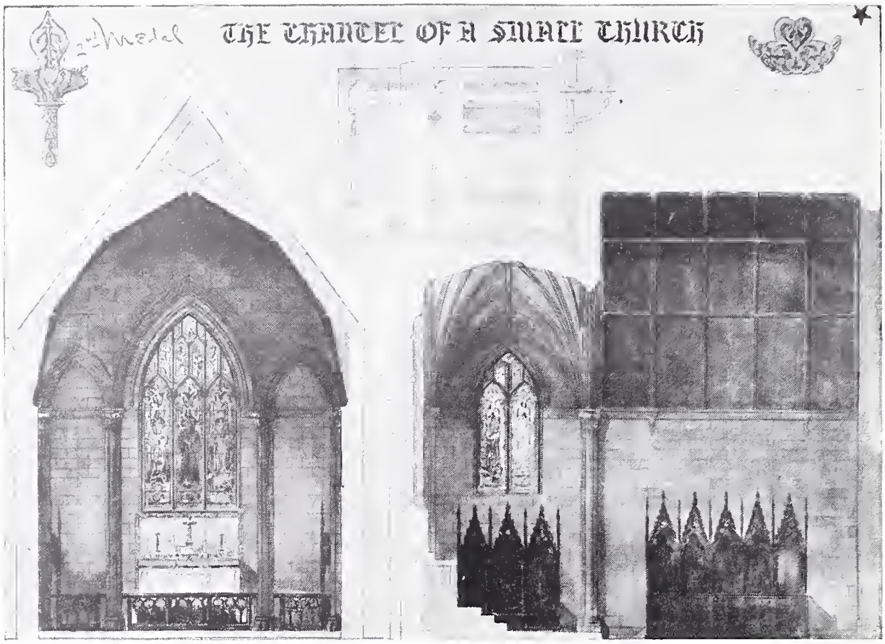
"The Tilt was introduced to obviate this danger. The tilt or toile, was at first a rope hung with a cloath stretched along the middle of the lists, later it became a barrier of planks along which the tilters charged in opposite directions."

The Knights who were to tilt separated by this wooden barrier charged on either side of it with their left side inwards. The shield was also carried on this side and reinforcements to the armor added.

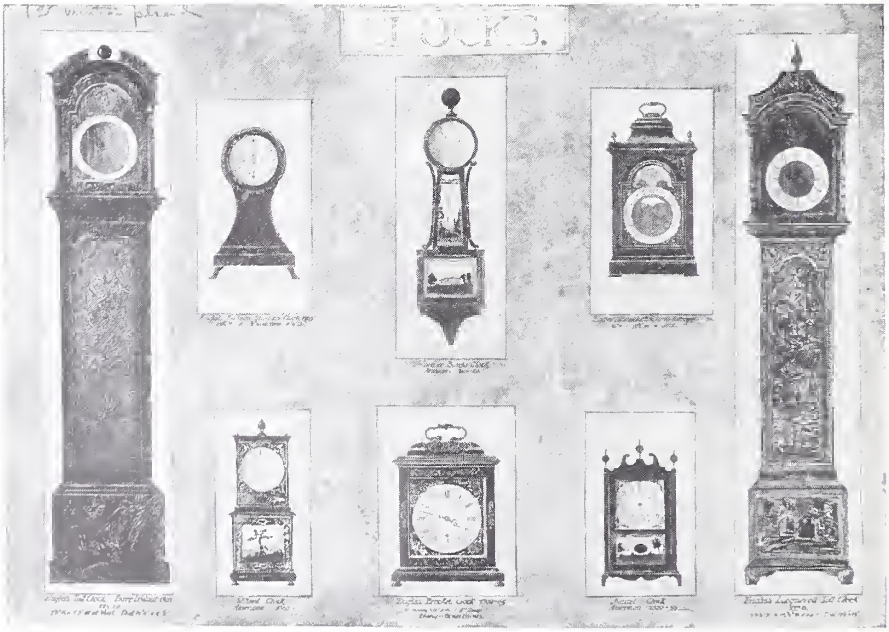
The lance was held at rest in the right hand and additional support given to it by the Quene or lance rest fastened to the breast-plate. It was held in such a manner that it crossed over the horse's neck to the left side, striking the adversary's armor at an angle.

At first the idea was to unhorse the opponent; to frustrate this the saddles were built with high projections both in back and front. In the foreground of the model a copy of a saddle taken from a drawing by Viollet-Le-Duc shows the style in use. Later this dangerous method of tilting was done away with and the shivering of lances became the all-important event. With this idea in view the lances were made light and hollow. Scores were carefully kept and points given.

Much of the information concerning a tilt over the barrier as shown in the model was obtained from the miniatures in the valuable old *MS.* of Petitjehan de Saintré, written by Anthornide de la Sale in 1459, which gives us most valuable contemporaneous pictures of the tournament of the Fifteenth Century.


2nd Medal
THE CHANCEL OF A SMALL CHURCH

Second Medal—L. Van Sciver



First Mention—A. B. Christie

Monthly Competitions, Beaux Arts Institute of Design

Awards to Students of The Pennsylvania Museum and School of Industrial Art

THERE were before the close of the Scholastic year, two judgments at the Beaux Arts Institute of Design. In the Department of Mural Painting two domestic problems were given, the first a design for a bath room painted in the Pompeian style, the second the decoration of a dining-room.

Twenty sketches were submitted for judgment, and the following awards were made by a jury consisting of Messrs. Henry R. Sedgwick, Shepherd Stevens, Ernest Peixotto, Edwin C. Taylor, Allyn Cox, Ivan Olinsky and Duncan Smith.

First Mention: Robert Cale, Pennsylvania Museum and School of Industrial Art. *Second Mention:* Harry R. Rock, Pennsylvania Museum and School of Industrial Art.

The scheme for the dining-room called for "dark and mysterious" walls painted with woodland scenes after the manner of verdure tapestries, with figures and animals of secondary interest, the entire light of the room being centered on the table. An interesting group of sixteen sketches was submitted and the following awards made:

First Mention: Reyna S. Ullman, Yale School of Fine Arts. *Second Mention:* C. G. Johnstone, Yale School of Fine Arts; K. Starr, Pennsylvania Museum and School of Industrial Art.

The jury consisted of Messrs. Richard H. Dana, Jr., Ernest Peixotto, Edwin C. Taylor, Duncan Smith, Arthur Crisp and Allyn Cox.

The Department of Interior Decoration called for sketches for the decoration of the "Chancel of a Small Church," a simple Gothic structure in a suburban community. The drawings submitted must show the furniture, choir stalls, bishop's throne, pulpit, etc., as well as the treatment of the chancel walls and of the roof. Nineteen designs were submitted and the following awards made:

Second Medal: L. Van Sciver, Pennsylvania Museum and School of Industrial Art, Philadelphia. *First Mention:* Marian Fogg and G. I. Johnson, Pennsylvania Museum and School of Industrial Art.

For the elementary problem the subject given was "Clocks," the program calling for an arrangement of eight clocks of various types, sizes and styles, including at least one small desk clock and one tall or "Grandfather" clock. Nineteen designs were submitted and the following awards made:

First Mention: A. B. Christie, Pennsylvania Museum and School of Industrial Art, Philadelphia. *Second Mention:* M. A. Stout, Pennsylvania Museum and School of Industrial Art, Philadelphia.

Membership in the Corporation

The Trustees of the Pennsylvania Museum and School of Industrial Art desire the active co-operation of all public-spirited citizens who are in sympathy with its work.

The institution has only the nucleus of an endowment and depends for its support, in addition to the very moderate fees for tuition and appropriations from the City and State, on the dues of members, of which there are eight classes, as follows:

Classification of Members

Benefactors in Perpetuity, who contribute or bequeath $25,000 or more to the Corporation.

Patrons in Perpetuity, who contribute or bequeath $5,000 to the Corporation.

Fellows for Life, who contribute $1,000 at one time.

Life Members, who contribute $300 at one time.

Fellows, who contribute $250 a year.

Sustaining Members, who contribute $100 a year.

Contributing Members, who contribute $25 a year.

Annual Members, who contribute $10 a year.

Fellows or Sustaining Members whose contributions aggregate $1,000 may be elected Fellows for Life.

Benefactors, Patrons, Fellows for Life and Life Members shall not be liable to annual dues.

All members are entitled to the following benefits:

The right to vote and transact business at the Annual Meeting.

Invitations to all general receptions and exhibitions held at the Museum and the School.

Free access to the Museum and School Libraries.

Admission to the following Illustrated Lectures:

Thirty Lectures on THE EVOLUTION OF ORNAMENTAL MOTIVES, given by Huger Elliott, Principal of the School, on Tuesdays, at 11 A. M., beginning September 25th. (December 25th, January 1st and March 25th omitted.)

Twenty-six Lectures on THE ELEMENTS OF ARCHITECTURE FOR INTERIOR DECORATORS, given by J. Frank Copeland, on Wednesdays, at 9 A. M., beginning October 3rd. (December 19th, 26th and March 26th omitted.)

A group of twenty Lectures on ART TOPICS, by prominent Philadelphians, on Wednesday afternoons, at 4.10, beginning October 10th. (December 19th, 26th and January 2nd omitted.)

Twenty-four Lectures on FURNITURE: ITS HISTORIC DEVELOPMENT, given by Edward Warwick, on Wednesday evenings, at 7.30 o'clock, beginning October 3rd. (December 19th and 26th omitted.)

Thirty Lectures on ARTISTIC EXPRESSION, given by Huger Elliott, Principal of the School, on Thursdays, at 9.00 A. M., beginning September 27th. (November 29th, December 20th and 27th and March 27th omitted.)

Also a copy of each of the following publications:

Illustrated Monthly BULLETIN of the Museum.

Annual Report of the Corporation.

Annual Circulars of the School.

Art Handbooks and Art Primers, issued from time to time by the Museum.

(A printed list of publications will be mailed to any member on application.)

A list of members is published each year in the Annual Report. All persons who are in sympathy with the work of the institution will be cordially welcomed as members.

Applications for membership, and remittances should be sent to the Secretary, Charles H. Winslow, at the School, Broad and Pine Streets, Philadelphia, Pa.

Calendar of Exhibitions

Memorial Hall, Fairmount Park

Napoleonic Silver, specimens from the silver service owned by Napoleon I, and lent by the French Institute in the United States—September 15-30—East Gallery.

Early Printed Books—September—Print Room.

Philadelphia Etchers and Engravers—October 1-22.

Philadelphia Illustrators—November 1-26.

Early English Prints—December 3-31.

Bookplates—January 7.

Exhibition of Daguerreotypes — February (dates to be announced).

Nineteenth Century Etching and Engraving—March (dates to be announced).

Retrospect Exhibition of American Illustrators—-April.

Opening of the new installation of Stained Glass—October 1—South Arcade.

Calendar of Lectures Held at the School

Broad and Pine Streets
1923-1924

Artistic Expression

A Critical Analysis of Architecture, Sculpture, Painting and the Minor Arts; Their Purpose, Development and Interdependence

By Huger Elliott, *Principal of the School*

Illustrated by Lantern Slides, Charts and by the Collections of the Museum

Thirty Lectures on Thursdays at 9.00 A. M., beginning September 27th. (November 29th, December 20th and 27th and March 27th omitted.)

Sept.	27.	Introductory. Taste, personal and collective. Use and beauty. Reasoned and emotional appreciation.

Some Necessary Dates

Oct.	4.	Architecture. The Historic Styles.
Oct.	11.	Sculpture. Ancient; Mediaeval; Renaissance; Modern.
Oct.	18.	Painting. National Characteristics.

General Considerations

Oct.	25.	Taste and appreciation. The Student and the Arts.
Nov.	1.	Artistic Expression. The creator. Tradition and environment.
Nov.	8.	Artistic Appreciation. The spectator.
Nov.	15.	Evolution in the Arts. Their interdependence. The fluctuations of taste.
Nov.	22.	The Passing Moment. The break with tradition. Archaeology. The photograph; the machine.
Dec.	6.	Limitations in the Fine and Industrial Arts.
Dec.	13.	Realism and the decorative spirit.
Jan.	3.	Sincerity.

Specific Considerations

Jan.	10, 17.	Architecture. The influence of civic, religious and geographical conditions. Public and semi-public structures.
Jan.	24.	Dwellings.
Jan.	31.	Landscape Architecture. Parks and gardens.
Feb.	7.	Sculpture. The Supremacy of Greece.
Feb.	14.	Sculpture. The Italian Renaissance. Other phases, ancient and modern.
Feb.	21.	Drawing and Painting. Methods and technique.
Feb.	28.	Drawing and Painting. Ideals, past and present.
Mar.	6.	Engraving; on wood; on metal. Lithography. Etching.
Mar.	13.	The Book. Printing.
Mar.	20.	Illustration. Advertisements.
Apr.	3.	Textiles.
Apr.	10.	Textiles. Dress and its relation to architecture.
Apr.	17.	Jewelry: its relation to dress.

Apr. 24. Furniture: the influence of the architectural styles; reflecting the social life of the period.
May 1. Ceramics, glass and silverware.
May 8. Tiles, mosaic and leaded glass windows.
May 15. Recapitulation.

FURNITURE: ITS HISTORIC DEVELOPMENT

MR. EDWARD WARWICK

Illustrated by Lantern Slides, Charts and Objects in the Museum

Twenty-three Lectures, on Wednesday evenings, at 7.30 o'clock, beginning October 3rd. (December 19th and 26th omitted.)

Oct. 3. Introduction.
Oct. 10. The Furniture of the Gothic period.
Oct. 17. The Age of Elizabeth.
Oct. 24. Jacobean.
Oct. 31. The Commonwealth.
Nov. 7. Carolean.
Nov. 14. The times of William and Mary.
Nov. 21. The Development under Queen Anne.
Nov. 28. Early Georgian Furniture.
Dec. 5. A Summing up of the foregoing periods.
Dec. 12. Concour.
Jan. 2. Chippendale. Early works.
Jan. 9. Chippendale. Later developments.
Jan. 16. France. Style of Louis XIV.
Jan. 23. France. The changes under Louis XV.
Jan. 30. France. Development under Louis XVI.
Feb. 6. The Brothers Adam.
Feb. 13. The Furniture of Hepplewhite.
Feb. 20. The Furniture of Sheraton.
Feb. 27. The Period of the Empire.
Mar. 5. The Early Renaissance in Italy.
Mar. 12. The Development of the Grand Mannes.
Mar. 19. Recapitulation.

THE EVOLUTION OF ORNAMENTAL MOTIVES

A Discussion of the Decorative Forms Used by Designers Throughout the Ages

By HUGER ELLIOTT, *Principal of the School*

Illustrated by Lantern Slides, Charts and by the Collections of the Museum

Thirty Lectures, on Tuesdays, at 11.00 A. M., beginning September 25th. (December 25th, January 1st and March 25 omitted.)

Sept. 25. Introduction. Ornament: its reason for being. Why it must be studied: how it should be studied.
Oct. 2. A brief survey of general history: racial characteristics. Some necessary dates.

General Considerations

Oct. 9. “Historic Ornament” and present-day problems. The loss of tradition.

Oct. 16. The choice of ornamental motives. Reason and the beauty sense. The emphasis of structure by ornament.

Oct. 23, 30. The control of ornament by the form of the object: by material and the method of manufacture.

Nov. 6, 13. The control of ornament by the form of the object: by material and the method of manufacture.

Nov. 20. Sources of ornamental motives: Geometric.

Nov. 27. Sources of ornamental motives: Derived from nature: flora.

Dec. 4. Sources of ornamental motives: Derived from nature: flora.

Dec. 11. Sources of ornamental motives: Derived from nature: fauna.

Dec. 18. Sources of ornamental motives: symbols: man-made objects: abstract forms.

Jan. 8. The persistance of certain motives: The unity of ornamental forms in the products of any given historic period.

The Ornamental Motives of the Various Periods Considered Chronologically, with Reference to Social Conditions, Natural Resources, Etc.

Jan. 15. Early gropings. Ideals of the Egyptians and of the ancient peoples of Asia Minor.

Jan. 22. The Greek feeling for beauty. Reasons for the enduring quality of their work.

Jan. 29. The Roman development of Greek forms. The far-reaching results of their dominance of Europe.

Feb. 5. Christian ideals. Byzantium and the oriental love of color.

Feb. 12. The teaching of Mahomet: Moslem Art.

Feb. 19. The ornamental motives of India.

Feb. 26. The art of China and Japan.

Mar. 4. The Romanesque style. The new forces in European culture: the re-shaping of Roman decorative elements.

Mar. 11. The Gothic period. Its artistic unity. The Gilds.

Mar. 18. The evolution of the style.

Apr. 1. Italy and the Classic spirit.

Apr. 8. The period of transition.

Apr. 15. The High Renaissance.

Apr. 22. Eighteenth Century Europe.

Apr. 29. The causes of the Revivals.

May 6. Present-day problems.

THE ELEMENTS OF ARCHITECTURE FOR INTERIOR DECORATORS

By J. Frank Copeland

Illustrated by Lantern Slides

Twenty-six Lectures, dates to be announced.

Introduction. The status of interior decoration in relation to architecture.
A consideration of floors.
Mouldings: the relation of form to use and of decoration to form.
The treatment of walls.
The arch.
Doorways and doors.
Ceilings: plaster and wood.
Vaults: structural forms and decoration.
Windows: framing and sash.
Windows: tracery.
Windows: leaded glass windows.
The column: base, shaft, cap.
The orders.
Gothic and other forms.
The classic entablature.
Parapets and balustrades.
Stairways and fireplaces.
Floor and wall coverings: hangings.
Lighting fixtures.
Furniture.
The choice and placing of furniture, bric-a-brac, etc.
Decorative sculpture.
Decorative painting.
Ecclesiastical forms.

THE WEDNESDAY AFTERNOON LECTURES

Beginning on October 10th a series of twenty lectures will be given in the Assembly Hall at the School. These talks illustrated by lantern slides, will be given by well-known Philadephians, each of whom will present in popular form, some topic in which he is particularly interested. Among the speakers will be Mr. Ellis Ames Ballard, Mr. Hamilton Bell, Dr. Arthur E. Bye, Mr. Andrew Wright Crawford, Mr. Nicola D'Ascenzo, Mr. Wilson Eyre, Mr. Charles Z. Klauder, Dr. R. Tait McKenzie, Mr. Harvey M. Watts and Dr. Samuel W. Woodhouse.

A special leaflet giving the dates, names of the speakers and subjects will be issued early in the autumn.

Anyone desiring a copy of this leaflet may obtain one by application to the Secretary, Mr. Charles H. Winslow, Broad and Pine Street. (Telephone, Locust 7473.)

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Mrs. William H. Walbaum
Mrs. Albert B. Weimer
Mrs. Jones Wister
Mrs. C. Stewart Wurts
Mrs. Alexander Coxe Yarnall

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Mrs. Percival Roberts, Jr.

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